

## SEQUENCE LISTING

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 Nakata, Yasuhiko  
 Nomura, Hitoshi

<120> NOVEL G PROTEIN-COUPLED RECEPTORS

<130> 06501-075001

<140> US 09/807,132

<141> 2001-04-06

<150> PCT/JP99/05578

<151> 1999-10-08

<150> JP 10/288565

<151> 1998-10-09

<150> JP 10/347546

<151> 1998-12-07

<150> JP 10/363537

<151> 1998-12-21

<160> 62

<170> FastSEQ for Windows Version 4.0

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| ctcattga | atg | gac | agt | cta | aac | caa | aca | aga | gtg | act | gaa | ttt | gtc | ttc | 50 |
|          | Met | Asp | Ser | Leu | Asn | Gln | Thr | Arg | Val | Thr | Glu | Phe | Val | Phe |    |
|          | 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| ttg | gga | ctc | act | gat | aac | cgg | gtg | ctg | gaa | atg | ctg | ttt | ttc | atg | gca | 98 |
| Leu | Gly | Leu | Thr | Asp | Asn | Arg | Val | Leu | Glu | Met | Leu | Phe | Phe | Met | Ala |    |
| 15  |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ttc | tca | gcc | att | tat | atg | cta | acg | ctt | tca | ggg | aac | att | ctc | atc | atc | 146 |
| Phe | Ser | Ala | Ile | Tyr | Met | Leu | Thr | Leu | Ser | Gly | Asn | Ile | Leu | Ile | Ile |     |
|     |     |     | 35  |     |     |     |     | 40  |     |     |     |     |     | 45  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| att | gcc | aca | gtc | ttt | act | cca | agt | ctc | cat | acc | ccc | atg | tat | ttc | ttc | 194 |
| Ile | Ala | Thr | Val | Phe | Thr | Pro | Ser | Leu | His | Thr | Pro | Met | Tyr | Phe | Phe |     |
|     |     |     | 50  |     |     |     |     | 55  |     |     |     |     |     | 60  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctg | agc | aat | ctg | tcc | ttt | att | gac | atc | tgc | cac | tca | tct | gtc | act | gtg | 242 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Asn | Leu | Ser | Phe | Ile | Asp | Ile | Cys | His | Ser | Ser | Val | Thr | Val |     |
|     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |
| cct | aag | atg | ttg | gag | ggg | ttg | ctt | tta | gaa | aga | aag | acc | att | tcc | ttt | 290 |
| Pro | Lys | Met | Leu | Glu | Gly | Leu | Leu | Leu | Glu | Arg | Lys | Thr | Ile | Ser | Phe |     |
|     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     |
| gac | aac | tgc | atc | aca | cag | ctc | ttc | ttc | cta | cat | ctc | ttt | gcc | tgt | gcc | 338 |
| Asp | Asn | Cys | Ile | Thr | Gln | Leu | Phe | Phe | Leu | His | Leu | Phe | Ala | Cys | Ala |     |
|     | 95  |     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |
| gag | atc | ttt | ctg | ctg | atc | att | gtg | gcg | tat | gat | cgt | tac | gtg | gct | atc | 386 |
| Glu | Ile | Phe | Leu | Leu | Ile | Ile | Val | Ala | Tyr | Asp | Arg | Tyr | Val | Ala | Ile |     |
|     |     |     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |
| tgc | act | cca | ctc | cac | tac | ccc | aat | gtg | atg | aac | atg | aga | gtc | tgt | ata | 434 |
| Cys | Thr | Pro | Leu | His | Tyr | Pro | Asn | Val | Met | Asn | Met | Arg | Val | Cys | Ile |     |
|     |     |     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |
| cag | ctt | gtc | ttt | gct | ctc | tgg | ttg | ggg | ggg | act | gtt | cac | tca | cta | ggg | 482 |
| Gln | Leu | Val | Phe | Ala | Leu | Trp | Leu | Gly | Gly | Thr | Val | His | Ser | Leu | Gly |     |
|     |     | 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     |
| cag | acc | ttc | ttg | act | att | cgt | cta | cct | tac | tgt | ggc | ccc | aac | att | att | 530 |
| Gln | Thr | Phe | Leu | Thr | Ile | Arg | Leu | Pro | Tyr | Cys | Gly | Pro | Asn | Ile | Ile |     |
|     | 160 |     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     |
| gac | agc | tac | ttc | tgt | gat | gtg | cct | ctt | gtt | atc | aag | ctg | gcc | tgc | aca | 578 |
| Asp | Ser | Tyr | Phe | Cys | Asp | Val | Pro | Leu | Val | Ile | Lys | Leu | Ala | Cys | Thr |     |
|     | 175 |     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |
| gat | aca | tac | ctc | aca | gga | ata | ctg | att | gtg | acc | aat | agt | gga | acc | atc | 626 |
| Asp | Thr | Tyr | Leu | Thr | Gly | Ile | Leu | Ile | Val | Thr | Asn | Ser | Gly | Thr | Ile |     |
|     |     |     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |
| tcc | ctc | tcc | tgt | ttc | ttg | gcc | gtg | gtc | acc | tcc | tat | atg | gtc | atc | ctg | 674 |
| Ser | Leu | Ser | Cys | Phe | Leu | Ala | Val | Val | Thr | Ser | Tyr | Met | Val | Ile | Leu |     |
|     |     |     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |
| gtt | tct | ctt | cga | aaa | cac | tca | gct | gaa | ggg | cgc | cag | aaa | gcc | ctg | tct | 722 |
| Val | Ser | Leu | Arg | Lys | His | Ser | Ala | Glu | Gly | Arg | Gln | Lys | Ala | Leu | Ser |     |
|     |     | 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     |
| acc | tgc | tgc | gcc | cac | ttc | atg | gtg | gtt | gcc | ctc | ttc | ttt | ggg | cca | tgt | 770 |
| Thr | Cys | Ser | Ala | His | Phe | Met | Val | Val | Ala | Leu | Phe | Phe | Gly | Pro | Cys |     |
|     | 240 |     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     |
| atc | ttc | atc | tat | act | cgg | cca | gac | acc | agc | ttc | tcc | att | gac | aag | gtg | 818 |
| Ile | Phe | Ile | Tyr | Thr | Arg | Pro | Asp | Thr | Ser | Phe | Ser | Ile | Asp | Lys | Val |     |
|     | 255 |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |
| gtg | tct | gtc | ttc | tac | aca | gtg | gtc | acc | cct | ttg | ctg | aat | ccc | ttc | att | 866 |
| Val | Ser | Val | Phe | Tyr | Thr | Val | Val | Thr | Pro | Leu | Leu | Asn | Pro | Phe | Ile |     |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |
| tac | acc | ttg | agg | aat | gag | gag | gta | aaa | agt | gcc | atg | aag | cag | ctc | agg | 914 |
| Tyr | Thr | Leu | Arg | Asn | Glu | Glu | Val | Lys | Ser | Ala | Met | Lys | Gln | Leu | Arg |     |

| 290  | 295 | 300 |      |
|--|-----|-----|------|
| cag aga caa gtt ttt ttc acg aaa tca tat aca taatgggcat tgggattgca  |     |     | 967  |
| Gln Arg Gln Val Phe Phe Thr Lys Ser Tyr Thr                        |     |     |      |
| 305  | 310 |     |      |
|  |     |     |      |
| gacataattg cagccacatc cttaatgaaa gagcaaaagt aaagagtcaa aatcaactta  |     |     | 1027 |
| tataacttgg taaattaggt aaaatggcat agagcaggtc agatttctgc tcattaaaga  |     |     | 1087 |
| taagaactta ttctgttcat taaagataag aacttattaa ctattattta aataaa      |     |     | 1143 |
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| attctctgagg-at atg gaa aga atc aac agc aca ctg ttg act gcg ttt atc |     |     | 51   |
| Met Glu Arg Ile Asn Ser Thr Leu Leu Thr Ala Phe Ile                |     |     |      |
| 1  | 5   | 10  |      |
|  |     |     |      |
| ctg aca gga att ccg tat cca ctc agg cta agg aca ctc ttt ttt gtg    |     |     | 99   |
| Leu Thr Gly Ile Pro Tyr Pro Leu Arg Leu Arg Thr Leu Phe Phe Val    |     |     |      |
| 15   | 20  | 25  |      |
|  |     |     |      |
| ttc ttt ttt cta atc tac atc ctg act cag ctg gga aac ctg ctt att    |     |     | 147  |
| Phe Phe Phe Leu Ile Tyr Ile Leu Thr Gln Leu Gly Asn Leu Leu Ile    |     |     |      |
| 30   | 35  | 40  | 45   |
|  |     |     |      |
| tta atc act gtc tgg gca gac cca agg ctc cat gcc cgc ccc atg tac    |     |     | 195  |
| Leu Ile Thr Val Trp Ala Asp Pro Arg Leu His Ala Arg Pro Met Tyr    |     |     |      |
| 50   | 55  | 60  |      |
|  |     |     |      |
| atc ttt ctt ggt gtt ctc tca gtc att gat atg agc atc tcc tcc atc    |     |     | 243  |
| Ile Phe Leu Gly Val Leu Ser Val Ile Asp Met Ser Ile Ser Ser Ile    |     |     |      |
| 65   | 70  | 75  |      |
|  |     |     |      |
| att gtc cct cgc ctc atg atg aac ttc act tta ggt gtc aaa ccc atc    |     |     | 291  |
| Ile Val Pro Arg Leu Met Met Asn Phe Thr Leu Gly Val Lys Pro Ile    |     |     |      |
| 80   | 85  | 90  |      |
|  |     |     |      |
| cca ttt ggt ggc tgt gtt gct caa ctc tat ttc tat cac ttc ctg ggc    |     |     | 339  |
| Pro Phe Gly Gly Cys Val Ala Gln Leu Tyr Phe Tyr His Phe Leu Gly    |     |     |      |
| 95   | 100 | 105 |      |
|  |     |     |      |
| agc acc cag tgc ttc ctc tac acc cta atg gcc tat gac agg tac ctg    |     |     | 387  |
| Ser Thr Gln Cys Phe Leu Tyr Thr Leu Met Ala Tyr Asp Arg Tyr Leu    |     |     |      |
| 110  | 115 | 120 | 125  |
|  |     |     |      |
| gca ata tgt cag ccc ctg cgc tac cct gtg ctc atg act gct aag ctg    |     |     | 435  |
| Ala Ile Cys Gln Pro Leu Arg Tyr Pro Val Leu Met Thr Ala Lys Leu    |     |     |      |
| 130  | 135 | 140 |      |
|  |     |     |      |
| agc gcc ttg ctt gtg gct gga gcc tgg atg gca gga tcc atc cat ggg    |     |     | 483  |

|            |            |            |            |             |            |      |     |     |     |     |     |            |     |     |     |     |  |
|------------|------------|------------|------------|-------------|------------|------|-----|-----|-----|-----|-----|------------|-----|-----|-----|-----|--|
| Ser        | Ala        | Leu        | Leu        | Val         | Ala        | Gly  | Ala | Trp | Met | Ala | Gly | Ser        | Ile | His | Gly |     |  |
|            |            |            | 145        |             |            |      |     | 150 |     |     |     |            | 155 |     |     |     |  |
| gct        | ctc        | cag        | gcc        | atc         | cta        | acc  | ttc | cgc | ctg | ccc | tac | tgt        | ggg | ccc | aat | 531 |  |
| Ala        | Leu        | Gln        | Ala        | Ile         | Leu        | Thr  | Phe | Arg | Leu | Pro | Tyr | Cys        | Gly | Pro | Asn |     |  |
|            |            | 160        |            |             |            |      | 165 |     |     |     |     | 170        |     |     |     |     |  |
| cag        | gtg        | gat        | tac        | ttc         | ttc        | tgt  | gac | atc | cct | gca | gtg | ttg        | aga | ctg | gcc | 579 |  |
| Gln        | Val        | Asp        | Tyr        | Phe         | Phe        | Cys  | Asp | Ile | Pro | Ala | Val | Leu        | Arg | Leu | Ala |     |  |
|            |            | 175        |            |             |            | 180  |     |     |     |     | 185 |            |     |     |     |     |  |
| tgt        | gct        | gac        | aca        | aca         | gtc        | aac  | gag | ctg | gtg | acg | ttt | gta        | gac | att | ggg | 627 |  |
| Cys        | Ala        | Asp        | Thr        | Thr         | Val        | Asn  | Glu | Leu | Val | Thr | Phe | Val        | Asp | Ile | Gly |     |  |
| 190        |            |            |            |             | 195        |      |     |     | 200 |     |     |            |     |     | 205 |     |  |
| gtg        | gtg        | gtt        | gcc        | agt         | tgc        | ttc  | tcc | ctg | atc | ctc | ctc | tcc        | tac | ata | cag | 675 |  |
| Val        | Val        | Val        | Ala        | Ser         | Cys        | Phe  | Ser | Leu | Ile | Leu | Leu | Ser        | Tyr | Ile | Gln |     |  |
|            |            |            |            | 210         |            |      |     |     | 215 |     |     |            |     | 220 |     |     |  |
| atc        | att        | cag        | gcc        | atc         | ctg        | aga  | atc | cac | aca | gct | gat | ggg        | cgg | cgc | cgg | 723 |  |
| Ile        | Ile        | Gln        | Ala        | Ile         | Leu        | Arg  | Ile | His | Thr | Ala | Asp | Gly        | Arg | Arg | Arg |     |  |
|            |            |            | 225        |             |            |      |     | 230 |     |     |     |            | 235 |     |     |     |  |
| gct        | ttt        | tca        | act        | tgt         | gga        | gcc  | cat | gta | acc | gtg | gtc | acc        | gtg | tac | tat | 771 |  |
| Ala        | Phe        | Ser        | Thr        | Cys         | Gly        | Ala  | His | Val | Thr | Val | Val | Thr        | Val | Tyr | Tyr |     |  |
|            |            | 240        |            |             |            |      | 245 |     |     |     |     | 250        |     |     |     |     |  |
| gtg        | ccc        | tgt        | gcc        | ttc         | atc        | tac  | ctg | agg | cct | gaa | acc | aac        | agc | ccc | ctg | 819 |  |
| Val        | Pro        | Cys        | Ala        | Phe         | Ile        | Tyr  | Leu | Arg | Pro | Glu | Thr | Asn        | Ser | Pro | Leu |     |  |
|            | 255        |            |            |             |            | 260  |     |     |     |     | 265 |            |     |     |     |     |  |
| gat        | ggg        | gca        | gct        | gcc         | cta        | gtc  | ccc | acg | gcc | atc | act | cct        | ttc | ctc | aac | 867 |  |
| Asp        | Gly        | Ala        | Ala        | Ala         | Leu        | Val  | Pro | Thr | Ala | Ile | Thr | Pro        | Phe | Leu | Asn |     |  |
|            |            |            |            |             | 275        |      |     |     |     | 280 |     |            |     |     | 285 |     |  |
| ccc        | ctt        | atc        | tac        | act         | ctg        | cgg  | aac | caa | gag | gtg | aag | ctg        | gcc | ctg | aaa | 915 |  |
| Pro        | Leu        | Ile        | Tyr        | Thr         | Leu        | Arg  | Asn | Gln | Glu | Val | Lys | Leu        | Ala | Leu | Lys |     |  |
|            |            |            |            | 290         |            |      |     | 295 |     |     |     |            |     | 300 |     |     |  |
| aga        | atg        | ctc        | aga        | agc         | cca        | aga  | act | ccg | agt | gag | gtt | tgaaagtgtc |     |     |     | 961 |  |
| Arg        | Met        | Leu        | Arg        | Ser         | Pro        | Arg  | Thr | Pro | Ser | Glu | Val |            |     |     |     |     |  |
|            |            | 305        |            |             |            |      | 310 |     |     |     |     |            |     |     |     |     |  |
| tttctccac  | tagggaagct | gccacaatta | gaatttatta | taatgttttag | gcttcggtaa | 1021 |     |     |     |     |     |            |     |     |     |     |  |
| cttttttctt | ttcttcttgt | tttttctctt | ttatatagcc | atactgtatg  | atcaaacaca | 1081 |     |     |     |     |     |            |     |     |     |     |  |
| gtttaaggta | aaatactaac | tttctaacag | ttccttagta | tcctctcaag  | ataactctca | 1141 |     |     |     |     |     |            |     |     |     |     |  |
| gccactgcaa | gagtagagaa | tgagacaaaa | ttctcacaaa | ctaaaccaca  | ttaaacaatc | 1201 |     |     |     |     |     |            |     |     |     |     |  |
| cagaagaaag | aatgcaatag | tgtattttcc | aatgtctcag | taataaaa    |            | 1248 |     |     |     |     |     |            |     |     |     |     |  |

&lt;210&gt; 3

&lt;211&gt; 1431

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (410)...(1339)

&lt;400&gt; 3

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ggcaacctaa aagcaagcat ggacagttcc ttggtgaata accaaaaaca agatggagtc      60
tcgctctgtt gcccaggctg gagtgtagtg ggcgcctctc ggctcgctgc ggtctccgcc      120
tcccgggttc aggcgattct ccggcctcag cctcccgggt gcgtgggatt gcaggaacta      180
gaactaaagc gaggttaatt tccacagtga gaacatgctc cagacatccg agcaccagtg      240
tggctctgga aactccacag ataccacagg actagaaaaat aactggacaa tgggatgttc      300
tatcttgccc gaactgaggg atataaaaag ctccaaagac aaagaaagta ccatccaccc      360
atcccaaaag aaattatcct tccttctgaa aataagactg caaaaagac atg gga aag      418
                                         Met Gly Lys
                                         1

```

```

acc aaa aac aca tcg ctg gat gcc gtg gtg aca gat ttc att ctt ctg      466
Thr Lys Asn Thr Ser Leu Asp Ala Val Val Thr Asp Phe Ile Leu Leu
      5                      10                      15

```

```

ggt ttg tct cac ccc cca aat cta aga agc ctc ctc ttc ctg gtc ttc      514
Gly Leu Ser His Pro Pro Asn Leu Arg Ser Leu Leu Phe Leu Val Phe
      20                      25                      30                      35

```

```

ttc atc att tac atc ctc act cag ctg ggg aac ctg ctc att ctg ctc      562
Phe Ile Ile Tyr Ile Leu Thr Gln Leu Gly Asn Leu Leu Ile Leu Leu
                      40                      45                      50

```

```

acc atg tgg gct gac ccg aag ctc tgt gct cgc ccc atg tac att ctt      610
Thr Met Trp Ala Asp Pro Lys Leu Cys Ala Arg Pro Met Tyr Ile Leu
                      55                      60                      65

```

```

ctg gga gtg ctc tca ttc ctg gac atg tgg ctc tcc tca gtc acc gtt      658
Leu Gly Val Leu Ser Phe Leu Asp Met Trp Leu Ser Ser Val Thr Val
      70                      75                      80

```

```

cct cgg ctt att ttg gat ttt act cct tcc atc aag gct atc ccg ttt      706
Pro Arg Leu Ile Leu Asp Phe Thr Pro Ser Ile Lys Ala Ile Pro Phe
      85                      90                      95

```

```

ggt ggc tgt gtg gct caa ctg tat ttc ttt cac ttc ctg ggc agc acc      754
Gly Gly Cys Val Ala Gln Leu Tyr Phe Phe His Phe Leu Gly Ser Thr
      100                      105                      110                      115

```

```

cag tgc ttc ctc tac acc ttg atg gcc tat gac agg tac cta gca ata      802
Gln Cys Phe Leu Tyr Thr Leu Met Ala Tyr Asp Arg Tyr Leu Ala Ile
                      120                      125                      130

```

```

tgt cag ccc ctg cac tac cca gtg ctc atg aat ggg agg tta tgc aca      850
Cys Gln Pro Leu His Tyr Pro Val Leu Met Asn Gly Arg Leu Cys Thr
                      135                      140                      145

```

```

gtc ctt gtg gct gga gct tgg gtc gcc ggc tcc atg cat ggg tct atc      898
Val Leu Val Ala Gly Ala Trp Val Ala Gly Ser Met His Gly Ser Ile
                      150                      155                      160

```

```

cag gcc acc ttg acc ttc cgc ctg ccc tac tgt ggg ccc aat cag gtg      946
Gln Ala Thr Leu Thr Phe Arg Leu Pro Tyr Cys Gly Pro Asn Gln Val
      165                      170                      175

```

```

gat tac ttt atc tgt gac atc cgc gca gta ttg aga ctg gcc tgt gct      994

```

Asp Tyr Phe Ile Cys Asp Ile Arg Ala Val Leu Arg Leu Ala Cys Ala  
 180 185 190 195  
 gac aca act gtc aat gag ctt gtg acc ttt gtg gac gtc agg gta gtg 1042  
 Asp Thr Thr Val Asn Glu Leu Val Thr Phe Val Asp Val Arg Val Val  
 200 205 210  
 gcc gcc agt tgc ttc atg tta att ctg ctc tcc tat gcc aac ata gtc 1090  
 Ala Ala Ser Cys Phe Met Leu Ile Leu Leu Ser Tyr Ala Asn Ile Val  
 215 220 225  
 cat gcc atc ctg aag ata cgc acc gct gat ggg agg cgc cgg gcc ttc 1138  
 His Ala Ile Leu Lys Ile Arg Thr Ala Asp Gly Arg Arg Arg Ala Phe  
 230 235 240  
 tcc acc tgt ggc tcc cac cta atc gtg gtc aca gtc tac tat gtc ccc 1186  
 Ser Thr Cys Gly Ser His Leu Ile Val Val Thr Val Tyr Tyr Val Pro  
 245 250 255  
 tgt att ttc atc tac ctt agg gct ggc tcc aaa gac ccc ctg gat ggg 1234  
 Cys Ile Phe Ile Tyr Leu Arg Ala Gly Ser Lys Asp Pro Leu Asp Gly  
 260 265 270 275  
 gca gcg gct gtg ttt tac act gtt gtc act cca tta ctg aac ccc ctc 1282  
 Ala Ala Ala Val Phe Tyr Thr Val Val Thr Pro Leu Leu Asn Pro Leu  
 280 285 290  
 atc tat aca ctg agg aac cag gaa gtg aag tct gcc ctg aag agg ata 1330  
 Ile Tyr Thr Leu Arg Asn Gln Glu Val Lys Ser Ala Leu Lys Arg Ile  
 295 300 305  
 aca gca ggt tgaaggactg aatgaaaata agtaactaca tctgcatcat 1379  
 Thr Ala Gly  
 310  
 tatcactgcc actctcttca gctactgctg catgtgacaa atgcccaata aa 1431

<210> 4

<211> 313

<212> PRT

<213> Homo sapiens

<400> 4

Met Asp Ser Leu Asn Gln Thr Arg Val Thr Glu Phe Val Phe Leu Gly  
 1 5 10 15  
 Leu Thr Asp Asn Arg Val Leu Glu Met Leu Phe Phe Met Ala Phe Ser  
 20 25 30  
 Ala Ile Tyr Met Leu Thr Leu Ser Gly Asn Ile Leu Ile Ile Ala  
 35 40 45  
 Thr Val Phe Thr Pro Ser Leu His Thr Pro Met Tyr Phe Phe Leu Ser  
 50 55 60  
 Asn Leu Ser Phe Ile Asp Ile Cys His Ser Ser Val Thr Val Pro Lys  
 65 70 75 80  
 Met Leu Glu Gly Leu Leu Leu Glu Arg Lys Thr Ile Ser Phe Asp Asn  
 85 90 95  
 Cys Ile Thr Gln Leu Phe Phe Leu His Leu Phe Ala Cys Ala Glu Ile  
 100 105 110

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Phe Leu Leu Ile Ile Val Ala Tyr Asp Arg Tyr Val Ala Ile Cys Thr
    115                120                125
Pro Leu His Tyr Pro Asn Val Met Asn Met Arg Val Cys Ile Gln Leu
    130                135                140
Val Phe Ala Leu Trp Leu Gly Gly Thr Val His Ser Leu Gly Gln Thr
    145                150                155                160
Phe Leu Thr Ile Arg Leu Pro Tyr Cys Gly Pro Asn Ile Ile Asp Ser
    165                170                175
Tyr Phe Cys Asp Val Pro Leu Val Ile Lys Leu Ala Cys Thr Asp Thr
    180                185                190
Tyr Leu Thr Gly Ile Leu Ile Val Thr Asn Ser Gly Thr Ile Ser Leu
    195                200                205
Ser Cys Phe Leu Ala Val Val Thr Ser Tyr Met Val Ile Leu Val Ser
    210                215                220
Leu Arg Lys His Ser Ala Glu Gly Arg Gln Lys Ala Leu Ser Thr Cys
    225                230                235                240
Ser Ala His Phe Met Val Val Ala Leu Phe Phe Gly Pro Cys Ile Phe
    245                250                255
Ile Tyr Thr Arg Pro Asp Thr Ser Phe Ser Ile Asp Lys Val Val Ser
    260                265                270
Val Phe Tyr Thr Val Val Thr Pro Leu Leu Asn Pro Phe Ile Tyr Thr
    275                280                285
Leu Arg Asn Glu Glu Val Lys Ser Ala Met Lys Gln Leu Arg Gln Arg
    290                295                300
Gln Val Phe Phe Thr Lys Ser Tyr Thr
    305                310

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<210> 5

<211> 313

<212> PRT

<213> Homo sapiens

<400> 5

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Met Glu Arg Ile Asn Ser Thr Leu Leu Thr Ala Phe Ile Leu Thr Gly
    1                5                10                15
Ile Pro Tyr Pro Leu Arg Leu Arg Thr Leu Phe Phe Val Phe Phe Phe
    20                25                30
Leu Ile Tyr Ile Leu Thr Gln Leu Gly Asn Leu Leu Ile Leu Ile Thr
    35                40                45
Val Trp Ala Asp Pro Arg Leu His Ala Arg Pro Met Tyr Ile Phe Leu
    50                55                60
Gly Val Leu Ser Val Ile Asp Met Ser Ile Ser Ser Ile Ile Val Pro
    65                70                75                80
Arg Leu Met Met Asn Phe Thr Leu Gly Val Lys Pro Ile Pro Phe Gly
    85                90                95
Gly Cys Val Ala Gln Leu Tyr Phe Tyr His Phe Leu Gly Ser Thr Gln
    100                105                110
Cys Phe Leu Tyr Thr Leu Met Ala Tyr Asp Arg Tyr Leu Ala Ile Cys
    115                120                125
Gln Pro Leu Arg Tyr Pro Val Leu Met Thr Ala Lys Leu Ser Ala Leu
    130                135                140
Leu Val Ala Gly Ala Trp Met Ala Gly Ser Ile His Gly Ala Leu Gln
    145                150                155                160
Ala Ile Leu Thr Phe Arg Leu Pro Tyr Cys Gly Pro Asn Gln Val Asp
    165                170                175
Tyr Phe Phe Cys Asp Ile Pro Ala Val Leu Arg Leu Ala Cys Ala Asp
    180                185                190

```

```

Thr Thr Val Asn Glu Leu Val Thr Phe Val Asp Ile Gly Val Val Val
    195                200                205
Ala Ser Cys Phe Ser Leu Ile Leu Leu Ser Tyr Ile Gln Ile Ile Gln
    210                215                220
Ala Ile Leu Arg Ile His Thr Ala Asp Gly Arg Arg Arg Ala Phe Ser
225                230                235
Thr Cys Gly Ala His Val Thr Val Val Thr Val Tyr Tyr Val Pro Cys
    245                250                255
Ala Phe Ile Tyr Leu Arg Pro Glu Thr Asn Ser Pro Leu Asp Gly Ala
    260                265                270
Ala Ala Leu Val Pro Thr Ala Ile Thr Pro Phe Leu Asn Pro Leu Ile
    275                280                285
Tyr Thr Leu Arg Asn Gln Glu Val Lys Leu Ala Leu Lys Arg Met Leu
    290                295                300
Arg Ser Pro Arg Thr Pro Ser Glu Val
305                310

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<210> 6

<211> 310

<212> PRT

<213> Homo sapiens

<400> 6

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Met Gly Lys Thr Lys Asn Thr Ser Leu Asp Ala Val Val Thr Asp Phe
 1                5                10                15
Ile Leu Leu Gly Leu Ser His Pro Pro Asn Leu Arg Ser Leu Leu Phe
    20                25                30
Leu Val Phe Phe Ile Ile Tyr Ile Leu Thr Gln Leu Gly Asn Leu Leu
    35                40                45
Ile Leu Leu Thr Met Trp Ala Asp Pro Lys Leu Cys Ala Arg Pro Met
    50                55                60
Tyr Ile Leu Leu Gly Val Leu Ser Phe Leu Asp Met Trp Leu Ser Ser
65                70                75                80
Val Thr Val Pro Arg Leu Ile Leu Asp Phe Thr Pro Ser Ile Lys Ala
    85                90                95
Ile Pro Phe Gly Gly Cys Val Ala Gln Leu Tyr Phe Phe His Phe Leu
    100                105                110
Gly Ser Thr Gln Cys Phe Leu Tyr Thr Leu Met Ala Tyr Asp Arg Tyr
    115                120                125
Leu Ala Ile Cys Gln Pro Leu His Tyr Pro Val Leu Met Asn Gly Arg
    130                135                140
Leu Cys Thr Val Leu Val Ala Gly Ala Trp Val Ala Gly Ser Met His
145                150                155                160
Gly Ser Ile Gln Ala Thr Leu Thr Phe Arg Leu Pro Tyr Cys Gly Pro
    165                170                175
Asn Gln Val Asp Tyr Phe Ile Cys Asp Ile Arg Ala Val Leu Arg Leu
    180                185                190
Ala Cys Ala Asp Thr Thr Val Asn Glu Leu Val Thr Phe Val Asp Val
    195                200                205
Arg Val Val Ala Ala Ser Cys Phe Met Leu Ile Leu Leu Ser Tyr Ala
    210                215                220
Asn Ile Val His Ala Ile Leu Lys Ile Arg Thr Ala Asp Gly Arg Arg
225                230                235                240
Arg Ala Phe Ser Thr Cys Gly Ser His Leu Ile Val Val Thr Val Tyr
    245                250                255
Tyr Val Pro Cys Ile Phe Ile Tyr Leu Arg Ala Gly Ser Lys Asp Pro
    260                265                270

```



Leu Asp Gly Ala Ala Ala Val Phe Tyr Thr Val Val Thr Pro Leu Leu  
           275                                  280                                  285  
 Asn Pro Leu Ile Tyr Thr Leu Arg Asn Gln Glu Val Lys Ser Ala Leu  
           290                                  295                                  300  
 Lys Arg Ile Thr Ala Gly  
 305                                  310

<210> 7  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 7  
 atggacagtc taaaccaaac aagagtg 27

<210> 8  
 <211> 27  
 <212> DNA  
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<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 8  
 atggcattct cagccattta tatgcta 27

<210> 9  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 9  
 gggaacattc tcatcatcat tgccaca 27

<210> 10  
 <211> 27  
 <212> DNA  
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<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 10  
 ttatgtatat gatttcgtga aaaaaac 27

<210> 11  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 11

tacctcctca ttcctcaagg tgtaa

27

<210> 12

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 12

ggtgaccact gtgtagaaga cagacac

27

<210> 13

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 13

atggaaagaa tcaacagcac actgttg

27

<210> 14

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 14

tctaattctac atcctgactc agctggg

27

<210> 15

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 15

ttcaaacctc actcggagtt cttgggc

27

<210> 16

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 16  
 agcttcacct cttggttccg cagagtg 27  
  
 <210> 17  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 17  
 atgggaaaga ccaaaaacac atcgctg 27  
  
 <210> 18  
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 <212> DNA  
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 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 18  
 cgtggtgaca gatttcattc ttctggg 27  
  
 <210> 19  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 19  
 tcaacctgct gttatcctct tcagggc 27  
  
 <210> 20  
 <211> 27  
 <212> DNA  
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 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 20  
 cctggttcct cagtgtatag atgaggg 27  
  
 <210> 21  
 <211> 942  
 <212> DNA  
 <213> Homo sapiens  
  
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 atggacagtc taaaccaaac aagagtgact gaatttgtct tcttgggact cactgataac 60  
 cgggtgctgg aaatgctgtt ttcatggca ttctcagcca tttatatgct aacgctttca 120  
 gggaacattc tcatcatcat tgccacagtc ttactccaa gtctccatac ccccatgtat 180  
 ttcttctga gcaatctgtc ctttattgac atctgccact catctgtcac tgtgcctaag 240

|            |            |             |            |            |            |     |
|------------|------------|-------------|------------|------------|------------|-----|
| atgttggagg | gtttgctttt | agaaagaaag  | accatttcct | ttgacaactg | catcacacag | 300 |
| ctcttcttcc | tacatctctt | tgcctgtgcc  | gagatctttc | tgctgatcat | tgtggcgtat | 360 |
| gatcgttacg | tggctatctg | cactccactc  | cactaccca  | atgtgatgaa | catgagagtc | 420 |
| tgtatacagc | ttgtctttgc | tctctggttg  | gggggtactg | ttcactcact | agggcagacc | 480 |
| ttcttgacta | ttcgtctacc | ttactgtggc  | cccaacatta | ttgacagcta | cttctgtgat | 540 |
| gtgcctcttg | ttatcaagct | ggcctgcaca  | gatacatacc | tcacaggaat | actgattgtg | 600 |
| accaatagtg | gaaccatctc | cctctcctgt  | ttcttggccg | tggtcacctc | ctatatggtc | 660 |
| atcctggttt | ctcttcgaaa | acactcagct  | gaaggcgcc  | agaaagccct | gtctacctgc | 720 |
| tcggcccact | tcatggtggt | tgcctcttct  | tttgggccat | gtatcttcat | ctatactcgg | 780 |
| ccagacacca | gcttctccat | tgacaagggtg | gtgtctgtct | tctacacagt | ggtcacccct | 840 |
| ttgctgaatc | ccttcattta | caccttgagg  | aatgaggagg | taaaaagtgc | catgaagcag | 900 |
| ctcaggcaga | gacaagtttt | tttcacgaaa  | tcatatacat | aa         |            | 942 |

&lt;210&gt; 22

&lt;211&gt; 942

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 22

|             |            |            |            |             |             |     |
|-------------|------------|------------|------------|-------------|-------------|-----|
| atggaaagaa  | tcaacagcac | actggtgact | gcgtttatcc | tgacaggaat  | tccgtatcca  | 60  |
| ctcaggctaa  | ggacactett | ttttgtgttc | ttttttctaa | tctacatcct  | gactcagctg  | 120 |
| ggaaacctgc  | ttattttaat | cactgtctgg | gcagacccaa | ggctccatgc  | ccgccccatg  | 180 |
| tacatctttc  | ttggtgttct | ctcagtcatt | gatatgagca | tctcctccat  | cattgtccct  | 240 |
| cgccatcatga | tgaacttcac | tttaggtgtc | aaacccatcc | catttgggtg  | ctgtgttgc   | 300 |
| caactctatt  | tctatcactt | cctgggcagc | acccagtgtc | tcctctacac  | cctaattggcc | 360 |
| tatgacaggt  | acctggcaat | atgtcagccc | ctgcgtacc  | ctgtgctcat  | gactgctaag  | 420 |
| ctgagcgcc   | tgttgtgtgc | tggagcctgg | atggcaggat | ccatccatgg  | ggctctccag  | 480 |
| gccatcctaa  | ccttcgcct  | gccctactgt | gggcccatac | aggtggatta  | cttcttctgt  | 540 |
| gacatccctg  | cagtgttgag | actggcctgt | gctgacacaa | cagtcaacga  | gctggtgacg  | 600 |
| tttgtagaca  | ttggggtggt | ggttgccagt | tgttctctcc | tgatcctcct  | ctcctacata  | 660 |
| cagatcattc  | aggccatcct | gagaatccac | acagctgatg | ggcggcgccg  | ggctttttca  | 720 |
| acttgtggag  | cccatgtaac | cgtggtcacc | gtgtactatg | tgccctgtgc  | cttcatctac  | 780 |
| ctgaggcctg  | aaaccaacag | ccccctggat | ggggcagctg | ccctagtccc  | cacggccatc  | 840 |
| actcctttcc  | tcaacccctt | tatctacact | ctgcggaacc | aagagggtgaa | gctggccctg  | 900 |
| aaaagaatgc  | tcagaagccc | aagaactccg | agtgaggttt | ga          |             | 942 |

&lt;210&gt; 23

&lt;211&gt; 933

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 23

|            |            |            |            |            |            |     |
|------------|------------|------------|------------|------------|------------|-----|
| atgggaaaga | ccaaaaacac | atcgctggat | gccgtggtga | cagatttcat | tcttctgggt | 60  |
| ttgtctcacc | ccccaaatct | aagaagcctc | ctcttcctgg | tcttcttcat | catttacatc | 120 |
| ctcactcagc | tggggaacct | gtcattcttg | ctcaccatgt | gggctgacct | gaagctctgt | 180 |
| gctcgcccca | tgtacattct | tctgggagtg | ctctcattcc | tggacatgtg | gctctcctca | 240 |
| gtcaccgttc | ctcggtttat | tttggatttt | actccttcca | tcaaggctat | cccgtttggt | 300 |
| ggctgtgtgg | ctcaactgta | tttctttcac | ttcctgggca | gcacctcagt | cttctctac  | 360 |
| accttgatgg | cctatgacag | gtacctagca | atatgtcagc | ccctgcaact | cccagtgtct | 420 |
| atgaatggga | ggttatgcac | agtccttgtg | gctggagctt | gggtcgccgg | ctccatgcat | 480 |
| gggtctatcc | aggccacctt | gaccttccgc | ctgcctact  | gtgggcccac | tcaggtggat | 540 |
| tactttatct | gtgacatccg | cgcagtattg | agactggcct | gtgctgacac | aactgtcaat | 600 |
| gagcttgtga | cctttgtgga | cgtcagggtg | gtggccgcca | gttgcttcat | gttaattctg | 660 |
| ctctcctatg | ccaacatagt | ccatgccatc | ctgaagatac | gcaccgctga | tgggagcgcc | 720 |
| cgggccttct | ccacctgtgg | ctcccaccta | atcgtggtca | cagtctacta | tgtcccctgt | 780 |
| atthtcatct | accttagggc | tggctccaaa | gacccctgg  | atggggcagc | ggctgtgttt | 840 |
| tacactgttg | tactccatt  | actgaacccc | ctcatctata | cactgaggaa | ccaggaagtg | 900 |

aagtctgccc tgaagaggat aacagcaggt tga 933

<210> 24  
 <211> 1060  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (17)...(892)

<400> 24  
 aaatgcctaa agaaga atg acc atg gaa aat tat tct atg gca gct cag ttt 52  
                   Met Thr Met Glu Asn Tyr Ser Met Ala Ala Gln Phe  
                   1                                  5                                  10

gtc tta gat ggt tta aca cag caa gca gag ctc cag ctg ccc ctc ttc 100  
 Val Leu Asp Gly Leu Thr Gln Gln Ala Glu Leu Gln Leu Pro Leu Phe  
                   15                                  20                                  25

ctc ctg ttc ctg gga atc tat gtg gtc aca gta gtg ggc aac ctg ggc 148  
 Leu Leu Phe Leu Gly Ile Tyr Val Val Thr Val Val Gly Asn Leu Gly  
                   30                                  35                                  40

atg att ctc ctg att gca gtc agc cct cta ctt cac acc ccc atg tac 196  
 Met Ile Leu Leu Ile Ala Val Ser Pro Leu Leu His Thr Pro Met Tyr  
                   45                                  50                                  55                                  60

tat ttc ctc agc agc ttg tcc ttc gtc gat ttc tgc tat tcc tct gtc 244  
 Tyr Phe Leu Ser Ser Leu Ser Phe Val Asp Phe Cys Tyr Ser Ser Val  
                                   65                                  70                                  75

att act ccc aaa atg ctg gtg aac ttc cta gga aag aag aat aca atc 292  
 Ile Thr Pro Lys Met Leu Val Asn Phe Leu Gly Lys Lys Asn Thr Ile  
                                   80                                  85                                  90

ctt tac tct gag tgc atg gtc cag ctc ttt ttc ttt gtg gtc ttt gtg 340  
 Leu Tyr Ser Glu Cys Met Val Gln Leu Phe Phe Phe Val Val Phe Val  
                   95                                  100                                  105

gtg gct gag ggt tac ctc ctg act gcc atg gca tat gat cgc tat gtt 388  
 Val Ala Glu Gly Tyr Leu Leu Thr Ala Met Ala Tyr Asp Arg Tyr Val  
                   110                                  115                                  120

gcc atc tgt agc cca ctg ctt tat aat gcg atc atg tcc tca tgg gtc 436  
 Ala Ile Cys Ser Pro Leu Leu Tyr Asn Ala Ile Met Ser Ser Trp Val  
                   125                                  130                                  135                                  140

tgc tca ctg cta gtg ctg gct gcc ttc ttc ttg ggc ttt ctc tct gcc 484  
 Cys Ser Leu Leu Val Leu Ala Ala Phe Phe Leu Gly Phe Leu Ser Ala  
                                   145                                  150                                  155

ttg act cat aca agt gcc atg atg aaa ctg tcc ttt tgc aaa tcc cac 532  
 Leu Thr His Thr Ser Ala Met Met Lys Leu Ser Phe Cys Lys Ser His  
                                   160                                  165                                  170

att atc aac cat tac ttc tgt gat gtt ctt ccc ctc ctc aat ctc tcc 580

|  |      |
|--|------|
| Ile Ile Asn His Tyr Phe Cys Asp Val Leu Pro Leu Leu Asn Leu Ser  |      |
| 175 180 185  |      |
| tgc tcc aac aca cac ctc aat gag ctt cta ctt ttt atc att gcg ggg  | 628  |
| Cys Ser Asn Thr His Leu Asn Glu Leu Leu Phe Ile Ile Ala Gly      |      |
| 190 195 200  |      |
| ttt aac acc ttg gtg ccc acc cta gct gtt gct gtc tcc tat gcc ttc  | 676  |
| Phe Asn Thr Leu Val Pro Thr Leu Ala Val Ala Val Ser Tyr Ala Phe  |      |
| 205 210 215 220  |      |
| atc ctc tac agc atc ctt cac atc cgc tcc tca gag ggc cgg tcc aaa  | 724  |
| Ile Leu Tyr Ser Ile Leu His Ile Arg Ser Ser Glu Gly Arg Ser Lys  |      |
| 225 230 235  |      |
| gct ttt gga aca tgc agc tct cat ctc atg gct gtg gtg atc ttc ttt  | 772  |
| Ala Phe Gly Thr Cys Ser Ser His Leu Met Ala Val Val Ile Phe Phe  |      |
| 240 245 250  |      |
| ggg tcc att acc ttc atg tat ttc aag ccc cct tca agt aac tcc ctg  | 820  |
| Gly Ser Ile Thr Phe Met Tyr Phe Lys Pro Pro Ser Ser Asn Ser Leu  |      |
| 255 260 265  |      |
| gac cag gag aag gtg tcc tct gtg ttc tac acc acg gtg atc ccc atg  | 868  |
| Asp Gln Glu Lys Val Ser Ser Val Phe Tyr Thr Thr Val Ile Pro Met  |      |
| 270 275 280  |      |
| ctg aac cct tta ata tac agt ctg taatcacagc actttggaag gctgaggcag | 922  |
| Leu Asn Pro Leu Ile Tyr Ser Leu                                  |      |
| 285 290  |      |
| ggttgcttga gtccagtttg agaccatcct gggaacata gtgcgatctt gtttctttcc | 982  |
| actgcctaaa aacttcaatg ctcaatttta cttgcaattt cctcttctg acatggagaa | 1042 |
| tgttggttg gaatgttc   | 1060 |
| <210> 25   |      |
| <211> 1069   |      |
| <212> DNA  |      |
| <213> Homo sapiens   |      |
| <220>  |      |
| <221> CDS  |      |
| <222> (18)...(956)   |      |
| <400> 25   |      |
| atttttgaag acaaaaa atg ctg gct aga aac aac tcc tta gtg act gaa   | 50   |
| Met Leu Ala Arg Asn Asn Ser Leu Val Thr Glu                      |      |
| 1 5 10   |      |
| ttt att ctt gct gga tta aca gat cgt cca gag ttc tgg caa ccc ttc  | 98   |
| Phe Ile Leu Ala Gly Leu Thr Asp Arg Pro Glu Phe Trp Gln Pro Phe  |      |
| 15 20 25   |      |
| ttt ttc ctg ttc cta gtg atc tac att gtc acc atg gta ggc aac ctt  | 146  |
| Phe Phe Leu Phe Leu Val Ile Tyr Ile Val Thr Met Val Gly Asn Leu  |      |
| 30 35 40   |      |

|   |     |
|---|-----|
| ggc ttg atc act ctt ttc ggt cta aat tct cac ctc cac aca cca atg<br>Gly Leu Ile Thr Leu Phe Gly Leu Asn Ser His Leu His Thr Pro Met<br>45 50 55        | 194 |
| tac tat ttc ctc ttc aat ctc tcc ttc att gat ctc tgt tac tcc tct<br>Tyr Tyr Phe Leu Phe Asn Leu Ser Phe Ile Asp Leu Cys Tyr Ser Ser<br>60 65 70 75     | 242 |
| gtt ttc act ccc aaa atg cta atg aac ttt gtg tca aaa aag aat att<br>Val Phe Thr Pro Lys Met Leu Met Asn Phe Val Ser Lys Lys Asn Ile<br>80 85 90        | 290 |
| atc tcc aat gtt ggg tgc atg act cgg ctg ttt ttc ttt ctc ttt ttc<br>Ile Ser Asn Val Gly Cys Met Thr Arg Leu Phe Phe Phe Leu Phe Phe<br>95 100 105      | 338 |
| gtc atc tct gaa tgt tac atg ttg acc tca atg gca tat gat cgc tat<br>Val Ile Ser Glu Cys Tyr Met Leu Thr Ser Met Ala Tyr Asp Arg Tyr<br>110 115 120     | 386 |
| gtg gcc atc tgt aat cca ttg ctg tat aag gtc acc atg tcc cat cag<br>Val Ala Ile Cys Asn Pro Leu Leu Tyr Lys Val Thr Met Ser His Gln<br>125 130 135     | 434 |
| gtc tgt tct atg ctc act ttt gct gct tac ata atg gga ttg gct gga<br>Val Cys Ser Met Leu Thr Phe Ala Ala Tyr Ile Met Gly Leu Ala Gly<br>140 145 150 155 | 482 |
| gcc acg gcc cac acc ggg tgc atg ttt aga ctc acc ttc tgc agt gct<br>Ala Thr Ala His Thr Gly Cys Met Phe Arg Leu Thr Phe Cys Ser Ala<br>160 165 170     | 530 |
| aat atc att aac cat tac ttg tgt gac ata ctc ccc ctc ctc cag ctt<br>Asn Ile Ile Asn His Tyr Leu Cys Asp Ile Leu Pro Leu Leu Gln Leu<br>175 180 185     | 578 |
| tcc tgc acc agc acc tat gtc aac gag gtg gtt gtt ctc att gtt gtg<br>Ser Cys Thr Ser Thr Tyr Val Asn Glu Val Val Val Leu Ile Val Val<br>190 195 200     | 626 |
| ggc act aat atc acg gta ccc agt tgt acc atc ctc att tct tat gtt<br>Gly Thr Asn Ile Thr Val Pro Ser Cys Thr Ile Leu Ile Ser Tyr Val<br>205 210 215     | 674 |
| ttc att gtc act agc att ctt cat atc aaa tcc act caa gga aga tca<br>Phe Ile Val Thr Ser Ile Leu His Ile Lys Ser Thr Gln Gly Arg Ser<br>220 225 230 235 | 722 |
| aaa gcc ttc agt act tgt agc tct cat gtc att gct ctg tct ctg ttt<br>Lys Ala Phe Ser Thr Cys Ser Ser His Val Ile Ala Leu Ser Leu Phe<br>240 245 250     | 770 |
| ttt ggg tca gcg gca ttc atg tat att aaa tat tct tct gga tct atg<br>Phe Gly Ser Ala Ala Phe Met Tyr Ile Lys Tyr Ser Ser Gly Ser Met<br>255 260 265     | 818 |
| gag cag gga aaa gtt ttt tct gtt ttc tac act aat gtg gtg ccc atg   | 866 |

|   |      |
|---|------|
| Glu Gln Gly Lys Val Phe Ser Val Phe Tyr Thr Asn Val Val Pro Met   |      |
| 270 275 280   |      |
| ctc aat ccc ctc atc tac agt ttg agg aac aag gat gtc aaa gtt gca   | 914  |
| Leu Asn Pro Leu Ile Tyr Ser Leu Arg Asn Lys Asp Val Lys Val Ala   |      |
| 285 290 295   |      |
| ctg agg aaa gct ctg att aaa att cag agg aga aat ata ttc           | 956  |
| Leu Arg Lys Ala Leu Ile Lys Ile Gln Arg Arg Asn Ile Phe           |      |
| 300 305 310   |      |
| taattagaag cagtaatgat gtaaaacaat tgaaggactt caaattttta ttagtgtttt | 1016 |
| tcatgaagag attttgttgt ttctacagat ggtgttatgt gtgatttaaat aaa       | 1069 |
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| <211> 1069  |      |
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| <221> CDS   |      |
| <222> (18)...(956)  |      |
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| atttttgaag acaaaaa atg ctg gct aga aac aac tcc tta gtg act gaa    | 50   |
| Met Leu Ala Arg Asn Asn Ser Leu Val Thr Glu                       |      |
| 1 5 10  |      |
| ttt att ctt gct gga tta aca gat cgt cca gag ttc cgg caa ccc ctc   | 98   |
| Phe Ile Leu Ala Gly Leu Thr Asp Arg Pro Glu Phe Arg Gln Pro Leu   |      |
| 15 20 25  |      |
| ttt ttc ctg ttt cta gtg atc tac att gtc acc atg gta ggc aac ctt   | 146  |
| Phe Phe Leu Phe Leu Val Ile Tyr Ile Val Thr Met Val Gly Asn Leu   |      |
| 30 35 40  |      |
| ggc ttg atc att ctt ttc ggt cta aat tct cac ctc cac aca cca atg   | 194  |
| Gly Leu Ile Ile Leu Phe Gly Leu Asn Ser His Leu His Thr Pro Met   |      |
| 45 50 55  |      |
| tac tat ttc ctc ttc aat ctc tcc ttc att gat ctc tgt tac tcc tct   | 242  |
| Tyr Tyr Phe Leu Phe Asn Leu Ser Phe Ile Asp Leu Cys Tyr Ser Ser   |      |
| 60 65 70 75   |      |
| gtt ttc act ccc aaa atg cta atg aac ttt gta tca aaa aag aat att   | 290  |
| Val Phe Thr Pro Lys Met Leu Met Asn Phe Val Ser Lys Lys Asn Ile   |      |
| 80 85 90  |      |
| atc tcc tat gtt ggg tgc atg act cag ctg ttt ttc ttt ctc ttt ttt   | 338  |
| Ile Ser Tyr Val Gly Cys Met Thr Gln Leu Phe Phe Phe Leu Phe Phe   |      |
| 95 100 105  |      |
| gtc atc tct gaa tgc tac ata ttg acc tca atg gca tat gat cgc tat   | 386  |
| Val Ile Ser Glu Cys Tyr Ile Leu Thr Ser Met Ala Tyr Asp Arg Tyr   |      |
| 110 115 120   |      |
| gtg gcc atc tgt aat cca ttg ctg tat aag gtc acc atg tcc cat cag   | 434  |



|            |            |            |            |            |            |     |     |     |     |     |     |     |     |     |     |      |
|------------|------------|------------|------------|------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Val        | Ala        | Ile        | Cys        | Asn        | Pro        | Leu | Leu | Tyr | Lys | Val | Thr | Met | Ser | His | Gln |      |
| 125        |            |            |            |            |            | 130 |     |     |     |     | 135 |     |     |     |     |      |
| gtc        | tgt        | tct        | atg        | ctc        | act        | ttt | gct | gct | tac | ata | atg | gga | ttg | gct | gga | 482  |
| Val        | Cys        | Ser        | Met        | Leu        | Thr        | Phe | Ala | Ala | Tyr | Ile | Met | Gly | Leu | Ala | Gly |      |
| 140        |            |            |            |            | 145        |     |     |     |     | 150 |     |     |     |     | 155 |      |
| gcc        | acg        | gcc        | cac        | acc        | ggg        | tgc | atg | ctt | aga | ctc | acc | ttc | tgc | agt | gct | 530  |
| Ala        | Thr        | Ala        | His        | Thr        | Gly        | Cys | Met | Leu | Arg | Leu | Thr | Phe | Cys | Ser | Ala |      |
|            |            |            |            | 160        |            |     |     |     | 165 |     |     |     |     |     | 170 |      |
| aat        | atc        | atc        | aac        | cat        | tac        | ttg | tgt | gac | ata | ctc | ccc | ctc | ctc | cag | ctt | 578  |
| Asn        | Ile        | Ile        | Asn        | His        | Tyr        | Leu | Cys | Asp | Ile | Leu | Pro | Leu | Leu | Gln | Leu |      |
|            |            |            | 175        |            |            |     |     | 180 |     |     |     |     |     | 185 |     |      |
| tcc        | tgc        | acc        | agc        | acc        | tat        | gtc | aac | gag | gtg | gtt | gtt | ctc | att | gtt | gtg | 626  |
| Ser        | Cys        | Thr        | Ser        | Thr        | Tyr        | Val | Asn | Glu | Val | Val | Val | Leu | Ile | Val | Val |      |
|            |            | 190        |            |            |            |     | 195 |     |     |     |     | 200 |     |     |     |      |
| ggt        | att        | aat        | atc        | atg        | gta        | ccc | agt | tgt | acc | atc | ctc | att | tct | tat | gtt | 674  |
| Gly        | Ile        | Asn        | Ile        | Met        | Val        | Pro | Ser | Cys | Thr | Ile | Leu | Ile | Ser | Tyr | Val |      |
|            | 205        |            |            |            |            | 210 |     |     |     |     | 215 |     |     |     |     |      |
| ttc        | att        | gtc        | act        | agc        | att        | ctt | cat | atc | aaa | tcc | act | caa | gga | aga | tca | 722  |
| Phe        | Ile        | Val        | Thr        | Ser        | Ile        | Leu | His | Ile | Lys | Ser | Thr | Gln | Gly | Arg | Ser |      |
| 220        |            |            |            |            | 225        |     |     |     |     | 230 |     |     |     |     | 235 |      |
| aaa        | gcc        | ttc        | agt        | act        | tgt        | agc | tct | cat | gtc | att | gct | ctg | tct | ctg | ttt | 770  |
| Lys        | Ala        | Phe        | Ser        | Thr        | Cys        | Ser | Ser | His | Val | Ile | Ala | Leu | Ser | Leu | Phe |      |
|            |            |            |            | 240        |            |     |     |     | 245 |     |     |     |     | 250 |     |      |
| ttt        | ggg        | tca        | gcg        | gca        | ttc        | atg | tat | att | aaa | tat | tct | tct | gga | tct | atg | 818  |
| Phe        | Gly        | Ser        | Ala        | Ala        | Phe        | Met | Tyr | Ile | Lys | Tyr | Ser | Ser | Gly | Ser | Met |      |
|            |            |            | 255        |            |            |     |     | 260 |     |     |     |     | 265 |     |     |      |
| gag        | cag        | gga        | aaa        | gtt        | tct        | tct | gtt | ttc | tac | act | aat | gtg | gtg | ccc | atg | 866  |
| Glu        | Gln        | Gly        | Lys        | Val        | Ser        | Ser | Val | Phe | Tyr | Thr | Asn | Val | Val | Pro | Met |      |
|            |            | 270        |            |            |            |     | 275 |     |     |     |     | 280 |     |     |     |      |
| ctc        | aat        | cct        | ctc        | atc        | tac        | agt | ttg | agg | aac | aag | gat | gtc | aaa | gtt | gca | 914  |
| Leu        | Asn        | Pro        | Leu        | Ile        | Tyr        | Ser | Leu | Arg | Asn | Lys | Asp | Val | Lys | Val | Ala |      |
|            | 285        |            |            |            |            | 290 |     |     |     |     | 295 |     |     |     |     |      |
| ctg        | agg        | aaa        | gct        | ctg        | att        | aaa | att | cag | aga | aga | aat | ata | ttc |     |     | 956  |
| Leu        | Arg        | Lys        | Ala        | Leu        | Ile        | Lys | Ile | Gln | Arg | Arg | Asn | Ile | Phe |     |     |      |
| 300        |            |            |            |            | 305        |     |     |     |     | 310 |     |     |     |     |     |      |
| taattagaag | cagtaataat | gtaaaacgat | tgaagaactt | taaattttta | ttagtgtgtt |     |     |     |     |     |     |     |     |     |     | 1016 |
| ccatgaagag | attttgttgt | ttctacagat | ggtgttatgt | gtgatttaat | aaa        |     |     |     |     |     |     |     |     |     |     | 1069 |

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 <220>  
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<222> (19) ... (945)

<400> 27

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|-------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| acagctcgcgc | aagagagaga | atg | act | ctg | aga | aac | agc | tcc | tca | gtg | act | gag |     |     |     | 51  |
|             |            | Met | Thr | Leu | Arg | Asn | Ser | Ser | Ser | Val | Thr | Glu |     |     |     |     |
|             |            | 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     |     |
| ttt         | atc        | ctt | gtg | gga | tta | tca | gaa | cag | cca | gag | ctc | cag | ctc | cct | ctt | 99  |
| Phe         | Ile        | Leu | Val | Gly | Leu | Ser | Glu | Gln | Pro | Glu | Leu | Gln | Leu | Pro | Leu |     |
|             |            |     | 15  |     |     |     | 20  |     |     |     |     |     | 25  |     |     |     |
| ttc         | ctt        | cta | ttc | tta | ggg | atc | tat | gtg | ttc | act | gtg | gtg | ggc | aac | ttg | 147 |
| Phe         | Leu        | Leu | Phe | Leu | Gly | Ile | Tyr | Val | Phe | Thr | Val | Val | Gly | Asn | Leu |     |
|             |            |     | 30  |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     |
| ggc         | ttg        | atc | acc | tta | att | ggg | ata | aat | cct | agc | ctt | cac | acc | ccc | atg | 195 |
| Gly         | Leu        | Ile | Thr | Leu | Ile | Gly | Ile | Asn | Pro | Ser | Leu | His | Thr | Pro | Met |     |
|             |            |     | 45  |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     |
| tac         | ttt        | ttc | ctc | ttc | aac | ttg | tcc | ttt | ata | gat | ctc | tgt | tat | tcc | tgt | 243 |
| Tyr         | Phe        | Phe | Leu | Phe | Asn | Leu | Ser | Phe | Ile | Asp | Leu | Cys | Tyr | Ser | Cys |     |
|             |            |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |
| gtg         | ttt        | acc | ccc | aaa | atg | ctg | aat | gac | ttt | ggt | tca | gaa | agt | atc | atc | 291 |
| Val         | Phe        | Thr | Pro | Lys | Met | Leu | Asn | Asp | Phe | Val | Ser | Glu | Ser | Ile | Ile |     |
|             |            |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |     |     |
| tct         | tat        | gtg | gga | tgt | atg | act | cag | cta | ttt | ttc | ttc | tgt | ttc | ttt | gtc | 339 |
| Ser         | Tyr        | Val | Gly | Cys | Met | Thr | Gln | Leu | Phe | Phe | Phe | Cys | Phe | Phe | Val |     |
|             |            |     | 95  |     |     |     | 100 |     |     |     |     |     | 105 |     |     |     |
| aat         | tct        | gag | tgc | tat | gtg | ttg | gta | tca | atg | gcc | tat | gat | cgc | tat | gtg | 387 |
| Asn         | Ser        | Glu | Cys | Tyr | Val | Leu | Val | Ser | Met | Ala | Tyr | Asp | Arg | Tyr | Val |     |
|             |            |     | 110 |     |     |     | 115 |     |     |     |     | 120 |     |     |     |     |
| gcc         | atc        | tgc | aac | ccc | ctg | ctc | tac | atg | gtc | acc | atg | tcc | cca | agg | gtc | 435 |
| Ala         | Ile        | Cys | Asn | Pro | Leu | Leu | Tyr | Met | Val | Thr | Met | Ser | Pro | Arg | Val |     |
|             |            |     | 125 |     |     |     | 130 |     |     |     |     | 135 |     |     |     |     |
| tgc         | ttt        | ctg | ctg | atg | ttt | ggt | tcc | tat | gtg | gta | ggg | ttt | gct | ggg | gcc | 483 |
| Cys         | Phe        | Leu | Leu | Met | Phe | Gly | Ser | Tyr | Val | Val | Gly | Phe | Ala | Gly | Ala |     |
|             |            |     |     | 145 |     |     |     |     |     | 150 |     |     |     |     | 155 |     |
| atg         | gcc        | cac | act | gga | agc | atg | ctg | cga | ctg | acc | ttc | tgt | gat | tcc | aac | 531 |
| Met         | Ala        | His | Thr | Gly | Ser | Met | Leu | Arg | Leu | Thr | Phe | Cys | Asp | Ser | Asn |     |
|             |            |     |     | 160 |     |     |     |     | 165 |     |     |     |     | 170 |     |     |
| gtc         | att        | gac | cat | tat | ctg | tgt | gac | ggt | ctc | ccc | ctc | ttg | cag | ctc | tcc | 579 |
| Val         | Ile        | Asp | His | Tyr | Leu | Cys | Asp | Val | Leu | Pro | Leu | Leu | Gln | Leu | Ser |     |
|             |            |     | 175 |     |     |     |     | 180 |     |     |     |     | 185 |     |     |     |
| tgc         | acc        | agc | acc | cat | gtc | agt | gag | ctg | gta | ttt | ttc | att | gtt | gtt | gga | 627 |
| Cys         | Thr        | Ser | Thr | His | Val | Ser | Glu | Leu | Val | Phe | Phe | Ile | Val | Val | Gly |     |
|             |            |     | 190 |     |     |     | 195 |     |     |     |     | 200 |     |     |     |     |
| gta         | atc        | acc | atg | cta | tcc | agc | ata | agc | atc | gtc | atc | tct | tac | gct | ttg | 675 |

| 205   | 210 | 215 |     |
|---|-----|-----|-----|
| ata ctc tcc aac atc ctc tgt att cct tct gca gag ggc aga tcc aaa |     |     | 723 |
| Ile Leu Ser Asn Ile Leu Cys Ile Pro Ser Ala Glu Gly Arg Ser Lys |     |     |     |
| 220   | 225 | 230 | 235 |
| gcc ttt agc aca tgg ggc tcc cac ata att gct gtt gct ctg ttt ttt |     |     | 771 |
| Ala Phe Ser Thr Trp Gly Ser His Ile Ile Ala Val Ala Leu Phe Phe |     |     |     |
|   | 240 | 245 | 250 |
| ggg tca ggg aca ttc acc tac tta aca aca tct ttt cct ggc tct atg |     |     | 819 |
| Gly Ser Gly Thr Phe Thr Tyr Leu Thr Thr Ser Phe Pro Gly Ser Met |     |     |     |
|   | 255 | 260 | 265 |
| aac cat ggc aga ttt gcc tca gtc ttt tac acc aat gtg gtt ccc atg |     |     | 867 |
| Asn His Gly Arg Phe Ala Ser Val Phe Tyr Thr Asn Val Val Pro Met |     |     |     |
|   | 270 | 275 | 280 |
| ctt aac cct tcg atc tac agt ttg agg aat aag gat gat aaa ctt gcc |     |     | 915 |
| Leu Asn Pro Ser Ile Tyr Ser Leu Arg Asn Lys Asp Asp Lys Leu Ala |     |     |     |
|   | 285 | 290 | 295 |
| ctg ggc aaa acc ctg aag aga gtg ctc ttc taatgggtct cttcatatca   |     |     | 965 |
| Leu Gly Lys Thr Leu Lys Arg Val Leu Phe                         |     |     |     |
| 300   | 305 |     |     |
| ctggcaaccg a  |     |     | 976 |
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| <212> PRT   |     |     |     |
| <213> Homo sapiens  |     |     |     |
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| Met Thr Met Glu Asn Tyr Ser Met Ala Ala Gln Phe Val Leu Asp Gly |     |     |     |
| 1 5 10 15   |     |     |     |
| Leu Thr Gln Gln Ala Glu Leu Gln Leu Pro Leu Phe Leu Leu Phe Leu |     |     |     |
| 20 25 30  |     |     |     |
| Gly Ile Tyr Val Val Thr Val Val Gly Asn Leu Gly Met Ile Leu Leu |     |     |     |
| 35 40 45  |     |     |     |
| Ile Ala Val Ser Pro Leu Leu His Thr Pro Met Tyr Tyr Phe Leu Ser |     |     |     |
| 50 55 60  |     |     |     |
| Ser Leu Ser Phe Val Asp Phe Cys Tyr Ser Ser Val Ile Thr Pro Lys |     |     |     |
| 65 70 75 80   |     |     |     |
| Met Leu Val Asn Phe Leu Gly Lys Lys Asn Thr Ile Leu Tyr Ser Glu |     |     |     |
| 85 90 95  |     |     |     |
| Cys Met Val Gln Leu Phe Phe Phe Val Val Phe Val Val Ala Glu Gly |     |     |     |
| 100 105 110   |     |     |     |
| Tyr Leu Leu Thr Ala Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Ser |     |     |     |
| 115 120 125   |     |     |     |
| Pro Leu Leu Tyr Asn Ala Ile Met Ser Ser Trp Val Cys Ser Leu Leu |     |     |     |
| 130 135 140   |     |     |     |
| Val Leu Ala Ala Phe Phe Leu Gly Phe Leu Ser Ala Leu Thr His Thr |     |     |     |
| 145 150 155 160   |     |     |     |
| Ser Ala Met Met Lys Leu Ser Phe Cys Lys Ser His Ile Ile Asn His |     |     |     |
| 165 170 175   |     |     |     |
| Tyr Phe Cys Asp Val Leu Pro Leu Leu Asn Leu Ser Cys Ser Asn Thr |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |  |
| His | Leu | Asn | Glu | Leu | Leu | Leu | Phe | Ile | Ile | Ala | Gly | Phe | Asn | Thr | Leu |  |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |  |
| Val | Pro | Thr | Leu | Ala | Val | Ala | Val | Ser | Tyr | Ala | Phe | Ile | Leu | Tyr | Ser |  |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |  |
| Ile | Leu | His | Ile | Arg | Ser | Ser | Glu | Gly | Arg | Ser | Lys | Ala | Phe | Gly | Thr |  |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |
| Cys | Ser | Ser | His | Leu | Met | Ala | Val | Val | Ile | Phe | Phe | Gly | Ser | Ile | Thr |  |  |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |
| Phe | Met | Tyr | Phe | Lys | Pro | Pro | Ser | Ser | Asn | Ser | Leu | Asp | Gln | Glu | Lys |  |  |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |  |
| Val | Ser | Ser | Val | Phe | Tyr | Thr | Thr | Val | Ile | Pro | Met | Leu | Asn | Pro | Leu |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |
| Ile | Tyr | Ser | Leu |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|     | 290 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |

&lt;210&gt; 29

&lt;211&gt; 313

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 29

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Leu | Ala | Arg | Asn | Asn | Ser | Leu | Val | Thr | Glu | Phe | Ile | Leu | Ala | Gly |  |  |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |  |
| Leu | Thr | Asp | Arg | Pro | Glu | Phe | Trp | Gln | Pro | Phe | Phe | Phe | Leu | Phe | Leu |  |  |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |     |     |  |  |
| Val | Ile | Tyr | Ile | Val | Thr | Met | Val | Gly | Asn | Leu | Gly | Leu | Ile | Thr | Leu |  |  |
|     | 35  |     |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |  |  |
| Phe | Gly | Leu | Asn | Ser | His | Leu | His | Thr | Pro | Met | Tyr | Tyr | Phe | Leu | Phe |  |  |
| 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |  |  |
| Asn | Leu | Ser | Phe | Ile | Asp | Leu | Cys | Tyr | Ser | Ser | Val | Phe | Thr | Pro | Lys |  |  |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |     | 80  |  |  |
| Met | Leu | Met | Asn | Phe | Val | Ser | Lys | Lys | Asn | Ile | Ile | Ser | Asn | Val | Gly |  |  |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |  |  |
| Cys | Met | Thr | Arg | Leu | Phe | Phe | Phe | Leu | Phe | Phe | Val | Ile | Ser | Glu | Cys |  |  |
|     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |  |  |
| Tyr | Met | Leu | Thr | Ser | Met | Ala | Tyr | Asp | Arg | Tyr | Val | Ala | Ile | Cys | Asn |  |  |
|     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |  |  |
| Pro | Leu | Leu | Tyr | Lys | Val | Thr | Met | Ser | His | Gln | Val | Cys | Ser | Met | Leu |  |  |
|     | 130 |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |     |  |  |
| Thr | Phe | Ala | Ala | Tyr | Ile | Met | Gly | Leu | Ala | Gly | Ala | Thr | Ala | His | Thr |  |  |
| 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     |     | 160 |  |  |
| Gly | Cys | Met | Phe | Arg | Leu | Thr | Phe | Cys | Ser | Ala | Asn | Ile | Ile | Asn | His |  |  |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |  |  |
| Tyr | Leu | Cys | Asp | Ile | Leu | Pro | Leu | Leu | Gln | Leu | Ser | Cys | Thr | Ser | Thr |  |  |
|     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |  |  |
| Tyr | Val | Asn | Glu | Val | Val | Val | Leu | Ile | Val | Val | Gly | Thr | Asn | Ile | Thr |  |  |
|     | 195 |     |     |     |     |     | 200 |     |     |     | 205 |     |     |     |     |  |  |
| Val | Pro | Ser | Cys | Thr | Ile | Leu | Ile | Ser | Tyr | Val | Phe | Ile | Val | Thr | Ser |  |  |
|     | 210 |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |  |  |
| Ile | Leu | His | Ile | Lys | Ser | Thr | Gln | Gly | Arg | Ser | Lys | Ala | Phe | Ser | Thr |  |  |
| 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     |     | 240 |  |  |
| Cys | Ser | Ser | His | Val | Ile | Ala | Leu | Ser | Leu | Phe | Phe | Gly | Ser | Ala | Ala |  |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |  |  |
| Phe | Met | Tyr | Ile | Lys | Tyr | Ser | Ser | Gly | Ser | Met | Glu | Gln | Gly | Lys | Val |  |  |
|     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |  |  |
| Phe | Ser | Val | Phe | Tyr | Thr | Asn | Val | Val | Pro | Met | Leu | Asn | Pro | Leu | Ile |  |  |

275                      280                      285  
 Tyr Ser Leu Arg Asn Lys Asp Val Lys Val Ala Leu Arg Lys Ala Leu  
 290                      295                      300  
 Ile Lys Ile Gln Arg Arg Asn Ile Phe  
 305                      310

<210> 30  
 <211> 313  
 <212> PRT  
 <213> Homo sapiens

<400> 30  
 Met Leu Ala Arg Asn Asn Ser Leu Val Thr Glu Phe Ile Leu Ala Gly  
 1                      5                      10                      15  
 Leu Thr Asp Arg Pro Glu Phe Arg Gln Pro Leu Phe Phe Leu Phe Leu  
 20                      25                      30  
 Val Ile Tyr Ile Val Thr Met Val Gly Asn Leu Gly Leu Ile Ile Leu  
 35                      40                      45  
 Phe Gly Leu Asn Ser His Leu His Thr Pro Met Tyr Tyr Phe Leu Phe  
 50                      55                      60  
 Asn Leu Ser Phe Ile Asp Leu Cys Tyr Ser Ser Val Phe Thr Pro Lys  
 65                      70                      75                      80  
 Met Leu Met Asn Phe Val Ser Lys Lys Asn Ile Ile Ser Tyr Val Gly  
 85                      90                      95  
 Cys Met Thr Gln Leu Phe Phe Phe Leu Phe Phe Val Ile Ser Glu Cys  
 100                      105                      110  
 Tyr Ile Leu Thr Ser Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Asn  
 115                      120                      125  
 Pro Leu Leu Tyr Lys Val Thr Met Ser His Gln Val Cys Ser Met Leu  
 130                      135                      140  
 Thr Phe Ala Ala Tyr Ile Met Gly Leu Ala Gly Ala Thr Ala His Thr  
 145                      150                      155                      160  
 Gly Cys Met Leu Arg Leu Thr Phe Cys Ser Ala Asn Ile Ile Asn His  
 165                      170                      175  
 Tyr Leu Cys Asp Ile Leu Pro Leu Leu Gln Leu Ser Cys Thr Ser Thr  
 180                      185                      190  
 Tyr Val Asn Glu Val Val Val Leu Ile Val Val Gly Ile Asn Ile Met  
 195                      200                      205  
 Val Pro Ser Cys Thr Ile Leu Ile Ser Tyr Val Phe Ile Val Thr Ser  
 210                      215                      220  
 Ile Leu His Ile Lys Ser Thr Gln Gly Arg Ser Lys Ala Phe Ser Thr  
 225                      230                      235                      240  
 Cys Ser Ser His Val Ile Ala Leu Ser Leu Phe Phe Gly Ser Ala Ala  
 245                      250                      255  
 Phe Met Tyr Ile Lys Tyr Ser Ser Gly Ser Met Glu Gln Gly Lys Val  
 260                      265                      270  
 Ser Ser Val Phe Tyr Thr Asn Val Val Pro Met Leu Asn Pro Leu Ile  
 275                      280                      285  
 Tyr Ser Leu Arg Asn Lys Asp Val Lys Val Ala Leu Arg Lys Ala Leu  
 290                      295                      300  
 Ile Lys Ile Gln Arg Arg Asn Ile Phe  
 305                      310

<210> 31  
 <211> 309  
 <212> PRT  
 <213> Homo sapiens

&lt;400&gt; 31

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Met Thr Leu Arg Asn Ser Ser Ser Val Thr Glu Phe Ile Leu Val Gly
 1          5          10          15
Leu Ser Glu Gln Pro Glu Leu Gln Leu Pro Leu Phe Leu Leu Phe Leu
      20          25          30
Gly Ile Tyr Val Phe Thr Val Val Gly Asn Leu Gly Leu Ile Thr Leu
 35          40          45
Ile Gly Ile Asn Pro Ser Leu His Thr Pro Met Tyr Phe Phe Leu Phe
 50          55          60
Asn Leu Ser Phe Ile Asp Leu Cys Tyr Ser Cys Val Phe Thr Pro Lys
 65          70          75          80
Met Leu Asn Asp Phe Val Ser Glu Ser Ile Ile Ser Tyr Val Gly Cys
      85          90          95
Met Thr Gln Leu Phe Phe Phe Cys Phe Phe Val Asn Ser Glu Cys Tyr
      100          105          110
Val Leu Val Ser Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Asn Pro
      115          120          125
Leu Leu Tyr Met Val Thr Met Ser Pro Arg Val Cys Phe Leu Leu Met
      130          135          140
Phe Gly Ser Tyr Val Val Gly Phe Ala Gly Ala Met Ala His Thr Gly
 145          150          155          160
Ser Met Leu Arg Leu Thr Phe Cys Asp Ser Asn Val Ile Asp His Tyr
      165          170          175
Leu Cys Asp Val Leu Pro Leu Leu Gln Leu Ser Cys Thr Ser Thr His
      180          185          190
Val Ser Glu Leu Val Phe Phe Ile Val Val Gly Val Ile Thr Met Leu
      195          200          205
Ser Ser Ile Ser Ile Val Ile Ser Tyr Ala Leu Ile Leu Ser Asn Ile
      210          215          220
Leu Cys Ile Pro Ser Ala Glu Gly Arg Ser Lys Ala Phe Ser Thr Trp
 225          230          235          240
Gly Ser His Ile Ile Ala Val Ala Leu Phe Phe Gly Ser Gly Thr Phe
      245          250          255
Thr Tyr Leu Thr Thr Ser Phe Pro Gly Ser Met Asn His Gly Arg Phe
      260          265          270
Ala Ser Val Phe Tyr Thr Asn Val Val Pro Met Leu Asn Pro Ser Ile
      275          280          285
Tyr Ser Leu Arg Asn Lys Asp Asp Lys Leu Ala Leu Gly Lys Thr Leu
      290          295          300
Lys Arg Val Leu Phe
305

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&lt;210&gt; 32

&lt;211&gt; 762

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (17)...(760)

&lt;400&gt; 32

```

aaatgcctaa agaaga atg acc atg gaa aat tat tct atg gca gct cag ttt
      Met Thr Met Glu Asn Tyr Ser Met Ala Ala Gln Phe
          1          5          10

```

52

|   |     |
|---|-----|
| gtc tta gat ggt tta aca cag caa gca gag ctc cag ctg ccc ctc ttc<br>Val Leu Asp Gly Leu Thr Gln Gln Ala Glu Leu Gln Leu Pro Leu Phe<br>15 20 25        | 100 |
| ctc ctg ttc ctg gga atc tat gtg gtc aca gta gtg ggc aac ctg ggc<br>Leu Leu Phe Leu Gly Ile Tyr Val Val Thr Val Val Gly Asn Leu Gly<br>30 35 40        | 148 |
| atg att ctc ctg att gca gtc agc cct cta ctt cac acc ccc atg tac<br>Met Ile Leu Leu Ile Ala Val Ser Pro Leu Leu His Thr Pro Met Tyr<br>45 50 55 60     | 196 |
| tat ttc ctc agc agc ttg tcc ttc gtc gat ttc tgc tat tcc tct gtc<br>Tyr Phe Leu Ser Ser Leu Ser Phe Val Asp Phe Cys Tyr Ser Ser Val<br>65 70 75        | 244 |
| att act ccc aaa atg ctg gtg aac ttc cta gga aag aag aat aca atc<br>Ile Thr Pro Lys Met Leu Val Asn Phe Leu Gly Lys Lys Asn Thr Ile<br>80 85 90        | 292 |
| ctt tac tct gag tgc atg gtc cag ctc ttt ttc ttt gtg gtc ttt gtg<br>Leu Tyr Ser Glu Cys Met Val Gln Leu Phe Phe Phe Val Val Phe Val<br>95 100 105      | 340 |
| gtg gct gag ggt tac ctc ctg act gcc atg gca tat gat cgc tat gtt<br>Val Ala Glu Gly Tyr Leu Leu Thr Ala Met Ala Tyr Asp Arg Tyr Val<br>110 115 120     | 388 |
| gcc atc tgt agc cca ctg ctt tat aat gcg atc atg tcc tca tgg gtc<br>Ala Ile Cys Ser Pro Leu Leu Tyr Asn Ala Ile Met Ser Ser Trp Val<br>125 130 135 140 | 436 |
| tgc tca ctg cta gtg ctg gct gcc ttc ttc ttg ggc ttt ctc tct gcc<br>Cys Ser Leu Leu Val Leu Ala Ala Phe Phe Leu Gly Phe Leu Ser Ala<br>145 150 155     | 484 |
| ttg act cat aca agt gcc atg atg aaa ctg tcc ttt tgc aaa tcc cac<br>Leu Thr His Thr Ser Ala Met Met Lys Leu Ser Phe Cys Lys Ser His<br>160 165 170     | 532 |
| att atc aac cat tac ttc tgt gat gtt ctt ccc ctc ctc aat ctc tcc<br>Ile Ile Asn His Tyr Phe Cys Asp Val Leu Pro Leu Leu Asn Leu Ser<br>175 180 185     | 580 |
| tgc tcc aac aca cac ctc aat gag ctt cta ctt ttt atc att gcg ggg<br>Cys Ser Asn Thr His Leu Asn Glu Leu Leu Leu Phe Ile Ile Ala Gly<br>190 195 200     | 628 |
| ttt aac acc ttg gtg ccc acc cta gct gtt gct gtc tcc tat gcc ttc<br>Phe Asn Thr Leu Val Pro Thr Leu Ala Val Ala Val Ser Tyr Ala Phe<br>205 210 215 220 | 676 |
| atc ctc tac agc atc ctt cac atc cgc tcc tca gag ggc cgg tcc aaa<br>Ile Leu Tyr Ser Ile Leu His Ile Arg Ser Ser Glu Gly Arg Ser Lys<br>225 230 235     | 724 |
| gct ttt gga aca tgc agc tct cat ctc atg gct gtg gt  | 762 |

Ala Phe Gly Thr Cys Ser Ser His Leu Met Ala Val  
 240 245

<210> 33  
 <211> 248  
 <212> PRT  
 <213> Homo sapiens

<400> 33  
 Met Thr Met Glu Asn Tyr Ser Met Ala Ala Gln Phe Val Leu Asp Gly  
 1 5 10 15  
 Leu Thr Gln Gln Ala Glu Leu Gln Leu Pro Leu Phe Leu Leu Phe Leu  
 20 25 30  
 Gly Ile Tyr Val Val Thr Val Val Gly Asn Leu Gly Met Ile Leu Leu  
 35 40 45  
 Ile Ala Val Ser Pro Leu Leu His Thr Pro Met Tyr Tyr Phe Leu Ser  
 50 55 60  
 Ser Leu Ser Phe Val Asp Phe Cys Tyr Ser Ser Val Ile Thr Pro Lys  
 65 70 75 80  
 Met Leu Val Asn Phe Leu Gly Lys Lys Asn Thr Ile Leu Tyr Ser Glu  
 85 90 95  
 Cys Met Val Gln Leu Phe Phe Phe Val Val Phe Val Val Ala Glu Gly  
 100 105 110  
 Tyr Leu Leu Thr Ala Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys Ser  
 115 120 125  
 Pro Leu Leu Tyr Asn Ala Ile Met Ser Ser Trp Val Cys Ser Leu Leu  
 130 135 140  
 Val Leu Ala Ala Phe Phe Leu Gly Phe Leu Ser Ala Leu Thr His Thr  
 145 150 155 160  
 Ser Ala Met Met Lys Leu Ser Phe Cys Lys Ser His Ile Ile Asn His  
 165 170 175  
 Tyr Phe Cys Asp Val Leu Pro Leu Leu Asn Leu Ser Cys Ser Asn Thr  
 180 185 190  
 His Leu Asn Glu Leu Leu Leu Phe Ile Ile Ala Gly Phe Asn Thr Leu  
 195 200 205  
 Val Pro Thr Leu Ala Val Ala Val Ser Tyr Ala Phe Ile Leu Tyr Ser  
 210 215 220  
 Ile Leu His Ile Arg Ser Ser Glu Gly Arg Ser Lys Ala Phe Gly Thr  
 225 230 235 240  
 Cys Ser Ser His Leu Met Ala Val  
 245

<210> 34  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 34  
 gaagagcagt gaggggtccat gttaagg

27

<210> 35  
 <211> 28  
 <212> DNA



<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 35

cagcagcttg tccttcgtcg atttctgc

28

<210> 36

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 36

gctagggtgg gcaccaaggt gttaaacc

29

<210> 37

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 37

tgcaaaagga cagtttcatc atggcac

27

<210> 38

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 38

caaagaactc acccaaattc ctacagct

28

<210> 39

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Artificially Synthesized Primer Sequence

<400> 39

catggtaggc aaccttggt tgatcac

27

<210> 40

<211> 29

<212> DNA

<213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 40  
 gtttattaaa tcacacataa caccatctg 29

<210> 41  
 <211> 29  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 41  
 cagagacaga gcaatgacat gagagctac 29

<210> 42  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 42  
 caaagaactc acccaaattc ctacagcc 28

<210> 43  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 43  
 catggtaggc aaccttggct tgatcat 27

<210> 44  
 <211> 29  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 44  
 gtttattaaa tcacacataa caccatctg 29

<210> 45  
 <211> 29  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Artificially Synthesized Primer Sequence

<400> 45  
 cagagacaga gcaatgacat gagagctac 29  
  
 <210> 46  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 46  
 ccagacagct cgccaagaga gaatgac 27  
  
 <210> 47  
 <211> 29  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 47  
 cctttataga tctctgttat tcctgtgtg 29  
  
 <210> 48  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 48  
 tcggttgcca gtgatatgaa gagaccc 27  
  
 <210> 49  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Artificially Synthesized Primer Sequence  
  
 <400> 49  
 ggctttggat ctgccctctg cagaagg 27  
  
 <210> 50  
 <211> 450  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 50  
 cagcagcttg tccttcgtcg atttctgcta ttcctctgtc attactccca aaatgctggt 60  
 gaacttccta ggaaagaaga atacaatcct ttactctgag tgcattgtcc agctcttttt 120  
 ctttctggtc tttgtggtgg ctgagggtta cctcctgact gccatggcat atgatcgcta 180

|            |             |            |            |            |            |     |
|------------|-------------|------------|------------|------------|------------|-----|
| tggtgccatc | tgtagccac   | tgtttataa  | tgcgatcatg | tcctcatggg | tctgtcact  | 240 |
| gctagtgtg  | gctgccttct  | tcttgggctt | tctctctgcc | ttgactcata | caagtgccat | 300 |
| gatgaaactg | tccttttgca  | aatcccat   | tatcaaccat | tacttctgtg | atgttcttcc | 360 |
| cctcctcaat | ctctcctgct  | ccaacacaca | cctcaatgag | cttctacttt | ttatcattgc | 420 |
| ggggtttaac | accttgggtgc | ccaccctagc |            |            |            | 450 |

<210> 51  
 <211> 637  
 <212> DNA  
 <213> Homo sapiens

|             |             |            |             |             |            |     |
|-------------|-------------|------------|-------------|-------------|------------|-----|
| <400> 51    |             |            |             |             |            |     |
| catggtaggc  | aaccttggct  | tgatcactct | tttcgggtcta | aattctcacc  | tccacacacc | 60  |
| aatgtactat  | ttcctcttca  | atctctcctt | cattgatctc  | tgttactcct  | ctgttttcac | 120 |
| tccaaaaatg  | ctaatagaact | ttgtgtcaaa | aaagaatatt  | atctccaatg  | ttgggtgcat | 180 |
| gactcggctg  | tttttctttc  | tctttttcgt | catctctgaa  | tgttacatgt  | tgacctcaat | 240 |
| ggcatatgat  | cgctatgtgg  | ccatctgtaa | tccattgctg  | tataagggtca | ccatgtccca | 300 |
| tcagggtctgt | tctatgctca  | cttttgctgc | ttacataatg  | ggattggctg  | gagccaaggc | 360 |
| ccacaccggg  | tgcatgttta  | gactcacctt | ctgcagtgtc  | aatatcatta  | accattactt | 420 |
| gtgtgacata  | ctccccctcc  | tccagctttc | ctgcaccagc  | acctatgtca  | acgagggtgg | 480 |
| tgttctcatt  | gttgtgggta  | ctaataacac | ggtagccagt  | tgtaccatcc  | tcatttctta | 540 |
| tgttttcatt  | gtcactagca  | ttcttcatat | caaattccact | caaggaagat  | caaaagcctt | 600 |
| cagtacttgt  | agctctcatg  | tcattgctct | gtctctg     |             |            | 637 |

<210> 52  
 <211> 637  
 <212> DNA  
 <213> Homo sapiens

|             |             |            |             |             |            |     |
|-------------|-------------|------------|-------------|-------------|------------|-----|
| <400> 52    |             |            |             |             |            |     |
| catggtaggc  | aaccttggct  | tgatcattct | tttcgggtcta | aattctcacc  | tccacacacc | 60  |
| aatgtactat  | ttcctcttca  | atctctcctt | cattgatctc  | tgttactcct  | ctgttttcac | 120 |
| tccaaaaatg  | ctaatagaact | ttgtatcaaa | aaagaatatt  | atctcctatg  | ttgggtgcat | 180 |
| gactcagctg  | tttttctttc  | tcttttttgt | catctctgaa  | tgctacatat  | tgacctcaat | 240 |
| ggcatatgat  | cgctatgtgg  | ccatctgtaa | tccattgctg  | tataagggtca | ccatgtccca | 300 |
| tcagggtctgt | tctatgctca  | cttttgctgc | ttacataatg  | ggattggctg  | gagccacggc | 360 |
| ccacaccggg  | tgcatgttta  | gactcacctt | ctgcagtgtc  | aatatcatca  | accattactt | 420 |
| gtgtgacata  | ctccccctcc  | tccagctttc | ctgcaccagc  | acctatgtca  | acgagggtgg | 480 |
| tgttctcatt  | gttgtgggta  | ttaatatcat | ggtagccagt  | tgtaccatcc  | tcatttctta | 540 |
| tgttttcatt  | gtcactagca  | ttcttcatat | caaattccact | caaggaagat  | caaaagcctt | 600 |
| cagtacttgt  | agctctcatg  | tcattgctct | gtctctg     |             |            | 637 |

<210> 53  
 <211> 509  
 <212> DNA  
 <213> Homo sapiens

|            |            |             |            |            |            |     |
|------------|------------|-------------|------------|------------|------------|-----|
| <400> 53   |            |             |            |            |            |     |
| cctttataga | tctctgttat | tctgtgtgt   | ttacccccaa | aatgctgaat | gactttgttt | 60  |
| cagaaagtat | catctcttat | gtgggatgta  | tgactcagct | atttttcttc | tgtttctttg | 120 |
| tcaattctga | gtgctatgtg | ttgggtatcaa | tggcctatga | tcgctatgtg | gccatctgca | 180 |
| acccctgtct | ctacatggtc | accatgtccc  | caagggtctg | ctttctgctg | atgtttgggt | 240 |
| cctatgtggg | aggggttgct | ggggccatgg  | cccacactgg | aagcatgctg | cgactgacct | 300 |
| tctgtgatcc | caacgtcatt | gaccattatc  | tgtgtgacgt | tctccccctc | ttgcagctct | 360 |
| cctgcaccag | cacccatgtc | agtgaagctg  | tatttttcat | tgttgttgga | gtaatcacca | 420 |
| tgctatccag | cataagcatc | gtcatctctt  | acgctttgat | actctccaac | atcctctgta | 480 |
| ttccttctgc | agagggcaga | tccaaagcc   |            |            |            | 509 |

<210> 54  
 <211> 10  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Exemplary motif

<221> VARIANT  
 <222> 7  
 <223> Xaa = Leu or Val

<221> VARIANT  
 <222> 9  
 <223> Xaa = Ile or Val

<400> 54  
 Met Ala Tyr Asp Arg Tyr Xaa Ala Xaa Cys  
   1                  5                  10

<210> 55  
 <211> 10  
 <212> PRT  
 <213> Homo sapiens

<400> 55  
 Val Ala Tyr Asp Arg Tyr Val Ala Ile Cys  
   1                  5                  10

<210> 56  
 <211> 10  
 <212> PRT  
 <213> Homo sapiens

<400> 56  
 Met Ala Tyr Asp Arg Tyr Leu Ala Ile Cys  
   1                  5                  10

<210> 57  
 <211> 14  
 <212> PRT  
 <213> Homo sapiens

<400> 57  
 Leu His Thr Pro Met Tyr Phe Phe Leu Ser Asn Leu Ser Phe  
   1                  5                  10

<210> 58  
 <211> 314  
 <212> PRT  
 <213> Homo sapiens

<400> 58  
 Met Glu Phe Thr Asp Arg Asn Tyr Thr Leu Val Thr Glu Phe Ile Leu  
   1                  5                  10                  15  
 Leu Gly Phe Pro Thr Arg Pro Glu Leu Gln Ile Val Leu Phe Leu Met





|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     |     | 180 |     |     |     |     | 185 |     |     |     | 190 |     |     |     |
| Ser | Ser | Asn | Glu | Val | Thr | Ile | Met | Val | Ser | Ser | Ile | Val | Leu | Leu | Met |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Pro | Leu | Cys | Leu | Val | Leu | Leu | Ser | Tyr | Ile | Gln | Ile | Ile | Ser | Thr |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ile | Leu | Lys | Ile | Gln | Ser | Arg | Glu | Gly | Arg | Lys | Lys | Ala | Phe | His | Thr |
| 225 |     |     |     | 230 |     |     |     |     |     | 235 |     |     |     |     | 240 |
| Cys | Ala | Ser | His | Leu | Thr | Val | Val | Ala | Leu | Cys | Tyr | Gly | Val | Ala | Ile |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |
| Phe | Thr | Tyr | Ile | Gln | Pro | His | Ser | Ser | Pro | Ser | Val | Leu | Gln | Glu | Lys |
|     |     |     | 260 |     |     |     | 265 |     |     |     |     | 270 |     |     |     |
| Leu | Phe | Ser | Val | Phe | Tyr | Ala | Ile | Leu | Thr | Pro | Met | Leu | Asn | Pro | Met |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ile | Tyr | Ser | Leu | Arg | Asn | Lys | Glu | Val | Lys | Gly | Ala | Trp | Gln | Lys | Leu |
|     | 290 |     |     |     | 295 |     |     |     |     |     | 300 |     |     |     |     |
| Leu | Trp | Lys | Phe | Ser | Gly | Leu | Thr | Ser | Lys | Leu | Ala | Thr |     |     |     |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     |     |

&lt;210&gt; 61

&lt;211&gt; 315

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 61

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Glu | Ala | Ile | Leu | Leu | Asn | Gln | Thr | Ser | Leu | Val | Thr | Tyr | Phe |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Arg | Leu | Arg | Gly | Leu | Ser | Val | Asn | His | Lys | Ala | Arg | Ile | Ala | Met | Phe |
|     |     |     | 20  |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| Ser | Met | Phe | Leu | Ile | Phe | Tyr | Val | Leu | Thr | Leu | Ile | Gly | Asn | Val | Leu |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| Ile | Val | Ile | Thr | Ile | Ile | Tyr | Asp | His | Arg | Leu | His | Thr | Pro | Met | Tyr |
|     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |
| Phe | Phe | Leu | Ser | Asn | Leu | Ser | Phe | Ile | Asp | Val | Cys | His | Ser | Thr | Val |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |
| Thr | Val | Pro | Lys | Met | Leu | Arg | Asp | Val | Trp | Ser | Glu | Glu | Lys | Leu | Ile |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Ser | Phe | Asp | Ala | Cys | Val | Thr | Gln | Met | Phe | Phe | Leu | His | Leu | Phe | Ala |
|     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |
| Cys | Thr | Glu | Ile | Phe | Leu | Leu | Thr | Val | Met | Ala | Tyr | Asp | Arg | Tyr | Val |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Ile | Cys | Lys | Pro | Leu | Gln | Tyr | Met | Ile | Val | Met | Asn | Trp | Lys | Val |
|     | 130 |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |     |
| Cys | Val | Leu | Leu | Ala | Val | Ala | Leu | Trp | Thr | Gly | Gly | Thr | Ile | His | Ser |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     | 160 |     |
| Ile | Ala | Leu | Thr | Ser | Leu | Thr | Ile | Lys | Leu | Pro | Tyr | Cys | Gly | Pro | Asp |
|     |     |     | 165 |     |     |     | 170 |     |     |     |     |     | 175 |     |     |
| Glu | Ile | Asp | Asn | Phe | Phe | Cys | Asp | Val | Pro | Gln | Val | Ile | Lys | Leu | Ala |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |
| Cys | Ile | Asp | Thr | Pro | Thr | Ser | Leu | Ile | Leu | Ile | Val | Ser | Asn | Ser | Gly |
|     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     |
| Leu | Ile | Ser | Val | Val | Cys | Phe | Val | Val | Leu | Val | Val | Ser | Tyr | Ala | Val |
|     | 210 |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |
| Ile | Leu | Val | Ser | Leu | Arg | Gln | Gln | Ile | Ser | Lys | Gly | Lys | Trp | Lys | Ala |
| 225 |     |     |     | 230 |     |     |     |     |     | 235 |     |     |     |     | 240 |
| Leu | Ser | Thr | Cys | Ala | Ala | His | Leu | Thr | Val | Val | Thr | Leu | Phe | Leu | Gly |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |
| His | Cys | Ile | Phe | Ile | Tyr | Ser | Arg | Pro | Ser | Thr | Ser | Leu | Pro | Glu | Asp |



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<210> 62
<211> 313
<212> PRT
<213> Homo sapiens
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[illegible]